WATER QUALITY INITIATIVE
TARGETED DEMONSTRATION WATERSHED PROJECTS
PRE-APPLICATION FOR FUNDING ASSISTANCE

Iowa Department of Agriculture & Land Stewardship

Proposal Cover Sheet: *(1 page maximum)*
Provide the following information on the Proposal Cover Sheet. Additionally, include the signature of the District Chairperson (*if applicable*) authorizing submission of the proposal.

1. Project Title: *City of Des Moines, DART & Norfolk Southern Land-Reclamation and Water Quality*

   Applicant Entity: *City of Des Moines*

   Contact Person: *Rita Conner – City of Des Moines – Economic Development Coordinator*

   Signature: Rita Conner

   Address: *Economic Development, Attn: Rita Conner*
   400 Robert D. Ray Drive
   Des Moines, Iowa 50309

   Phone: *515-283-4019*

   E-mail: *raconner@dmgov.org*

2. List the name, location, and the importance of the surface water that will be benefit by this project:
   The project site is located south of Martin Luther King Jr. Parkway, west of SW 11th Street, and north of the Raccoon River in downtown Des Moines. It includes sites that have been owned/are owned by Norfolk Southern, City of Des Moines and Des Moines Area Regional Transit (DART). Runoff from the area of interest is currently discharged to the Raccoon River. The Raccoon River is currently impaired due to high nitrate levels and pathogens. About one mile downstream of this site area, the Raccoon River meets the Des Moines River.

3. Include a listing of project partners at the time of pre-application:
   The City of Des Moines' primary partner in the reconstruction of the stormwater management system at the subject site is Hubbell Realty Company. Hubbell Realty currently has 75 acres to the north of the subject site under-contract with Norfolk Southern Railway, which is expected to close in early 2017. The City of Des Moines, Hubbell Realty and partners are currently evaluating funding options and developing plans to be able to anticipate construction initiation in the spring of 2017. Hubbell Realty has been building conservation communities in the Des Moines metro since 2006 in an effort to provide adequate stormwater conveyance, distribution of the water flow, and natural filtration of pollutants. The City of Des Moines has been working to prioritize staff training and community education on low impact development practices, and improving water quality in the City through a number of initiatives over the last decade. Other partners that will aid in the successful completion, on-going implementation, and educational opportunities include, Iowa Economic Development Authority, Des Moines Water Works, the Des Moines Public School District, Polk County Conservation, Urban Land Institute, the Des Moines Partnership, Polk Soil & Water Conservation District, and Iowa Storm Water Education.

4. Provide a total budget summary, utilizing the format shown here:

	IDALS Request	Applicant Contributions	Partner Contributions	Total Budget
April 1, 2017 – June 30, 2017	*$130,000*	*$325,000*	*$466,730*	*$921,730*
July 1, 2017 – June 30, 2018	*$70,000*	*$175,000*	*$251,315*	*$496,315*
Overall	*$200,000*	*$500,000*	*$718,045*	*$1,418,045*

Pre-Proposal Narrative: *(2 page maximum)*
(see attached two pages)

Provide a description of each practice utilizing the format shown here (*Table will not count towards the two-page maximum*):

Practice #1: *(provide name and description of practice)* *West wetland – conversion of a dry detention basin to a constructed wetland system, with more than three acres included in the wet and marsh zones.*	**IDALS:** *(IDALS budget contribution to practice)* *$137,610* **TOTAL:** *(Applicant and partner budget contributions to practice)* *$975,680*
Practice Details: *(provide a general description of the location, design status, permits required, and current permit status)* *The existing concrete flumes will be removed and two dry basins will be combined into a single practice. Post-construction flow will be diverted by micrograding through an extended path of shallow and deep water zones. Preliminary calculations indicate that full treatment of the water quality volume for the upstream watershed area can be achieved. Preliminary conceptual designs have been completed as part of urban master planning for this area. As this is currently a dry basin lacking wetland features or other critical habitat, it is expected that this practice on its own will only require local review and construction permits. More detailed studies and evaluations will be required to confirm this expectation.*	
Practice #2: *(provide name and description of practice)* *East wetland – conversion of a wet detention basin (DART pond) to a constructed wetland system, with more than three acres included in the wet and marsh zones.*	**IDALS:** *(IDALS budget contribution to practice)* *$62,390* **TOTAL:** *(Applicant and partner budget contributions to practice)* *$442,365*
Practice Details: *(provide a general description of the location, design status, permits required, and current permit status)* *The existing pond would be drained during construction. Micrograding will be used to route flow through an extended path of shallow and deep water zones. Preliminary calculations indicate that full treatment of the water quality volume for the upstream watershed area can be achieved. Preliminary conceptual designs have been completed as part of urban master planning for this area. This wet pond will need to be studied in greater detail to determine if it has wetland features or other critical habitat, which may need to be protected or mitigated. In addition to local review, a joint permit application to the IDNR and Corps of Engineers will be prepared and submitted, if necessary. More detailed studies and evaluations will be required to confirm the need for such permitting requirements.*	
Practice #3: *(provide name and description of practice)* ***NOT APPLICABLE***	**IDALS:** *(IDALS budget contribution to practice)* **TOTAL:** *(Applicant and partner budget contributions to practice)*
Practice Details: *(provide a general description of the location, design status, permits required, and current permit status)*	

Pre-Proposal Narrative (page 1 of 2)

- **Describe the primary components/practices that will be installed by this project.**

This project features a unique and innovative approach to using stormwater as a resource, rather than managing it as a waste product. Current planning efforts for urban redevelopment just south of downtown Des Moines have included plans to retrofit existing stormwater detention features into amenities within public open spaces adjacent to the Raccoon River. Currently storm sewer systems from this area drain into three separate detention basins. The western two basins are dry basins, and the eastern basin is a wet pond known to have algal blooms and other water quality issues. Currently these practices are only designed to serve detention of larger storm events. When water levels within each basin rise, pump systems turn on, providing a steady (and significant) discharge rate from each basin. This arrangement provides little opportunity to improve water quality issues related to small storm runoff. These basins lack features to reduce pollutant levels through settling, filtration, plant uptake or other biochemical processes.

The current proposal would retrofit the three basins into a constructed wetland system.

The existing western two dry basins would be merged into a single, larger wetland system. The wetland would feature a wetted area of just over three acres with a temporary storage above the pool of approximately 45 acre-feet available to provide runoff rate and volume reduction from medium to large storm events. The volume within the permanent pool would be devoted to management of the water quality volume. During construction, the existing flow path through the basins would be maintained, allowing the wetland microtopography to be created off-line, providing drier conditions for construction except in the case of extremely large storm events.

The eastern "DART Pond" will be converted to a wetland system in a similar configuration to the western wetland system. The DART Pond would be drained and diversions provided during construction to allow most micrograding to occur under drier conditions. It is possible that these features will be combined into a single larger wetland system; however preliminary reports indicate that these two systems may need to remain separate due to limits on high water elevations for the DART Pond. As currently planned, this feature would have a wetted area of over 3.5 acres, with approximately 20 acres of temporary storage available above the permanent pool.

Micrograding will create a series of shallow and deep water zones, forcing water to pass through a stormwater "maze" before reaching a new outlet, configured with multiple stages to control release rates during both small and large storm events. Native wetland vegetation will be established through seeding and installation of plugs or potted plants. A deep-water zone will be included to provide an open water area for improved aesthetics and allow a fish population to survive. Entry points to the wetland will feature forebays or other pre-treatment systems to allow heavier sediments to settle in a specified area where they can be removed more easily.

These ponds will be central features within open spaces protected by levees along the Raccoon River. A system of trails, boardwalks and piers is planned within these areas to provide access for interaction and maintenance through and around these features. This provides the opportunity for people to interact with a variety of wet and dry native habitats. Ongoing maintenance and management of the area will be proposed through public/private partnerships.

- **Describe the primary anticipated benefits from each partner and benefits to urban and rural populations in the watershed.**

The International BMP Database (bmpdatabase.org) list constructed wetland systems as providing significant reductions in concentrations of bacteria and nitrates – the key pollutants of concern which have led to the Raccoon River being considered as an impaired waterbody. It is expected that each basin will be able to provide management of the Water Quality Volume for their entire tributary area (not just the redevelopment area currently being planned).

Estimated Water Quality Volume (WQv) Requirements			
	Total Tributary Area (acres)	Estimated % Impervious Cover (at full buildout)	Water Quality Volume Requirements (acre-feet)
West Wetland	150	75	11.3
East Wetland	88	75	6.7

West Wetland – Preliminary Concept Design*				
Zone	% of wetted area	Area (acres)	Estimated Average Depth	Estimated Volume Provided
Pool	20	0.68	6.00 feet	4.1 acre-feet
Shallow marsh	35	1.19	1.00 feet	1.2 acre-feet
High marsh	45	1.53	0.25 feet	0.4 acre-feet
Extended Detention				5.6 acre-feet
			Totals	11.3 acre-feet

Pre-Proposal Narrative (page 2 of 2)

East Wetland – Preliminary Concept Design*				
Zone	% of wetted area	Area (acres)	Estimated Average Depth	Estimated Volume Provided
Pool	20	0.73	6.00 feet	4.3 acre-feet
Shallow marsh	40	1.46	1.00 feet	1.5 acre-feet
High marsh	40	1.46	0.25 feet	0.4 acre-feet
Extended Detention				0.5 acre-feet
			Totals	6.7 acre-feet

* Volumes shown are based on initial concept design and are only used to show feasibility of the wetland system to provide the required WQv for the tributary area. The calculation of volume will be adjusted as more detailed grading plans are developed.

The benefit to urban populations will be an attractive water feature with public access and improved water quality within the Raccoon River. The benefit to rural populations will be improved water quality within the Des Moines River and Red Rock Lake, which would be enhanced should this practice be combined with other watershed scale improvements.

- **If there will be other / future phases of this project or if the things that would be funded by this application are part of a larger scale project, describe the larger project and how this application fits in or compliments other aspects of a larger project.**

The reconstruction of the two west basins and one east basin is expected to be constructed in a single phase beginning in the spring of 2017, of which is proposed to be 65% complete prior to June 30, 2017 and finishing up at the beginning of fall 2017. This would completely transform one of the major stormwater systems serving downtown. Furthermore, this project is in conjunction with Hubbell Realty Company's plan to develop 75 acres neighboring the subject project with an urban mixed-use community that will act as a feature to Des Moines and the State of Iowa.

- **Describe how the project will be evaluated to determine if anticipated benefits are realized.**

A monitoring and maintenance program is planned to be included with this project to maximize the establishment of desired vegetation and reduce the presence of invasive species or other volunteer growth. Water quality samples will be able to be collected within the staged outlet structure, upstream of the pump inlet. These samples should be collected no less than monthly for a period of five years after construction. Sampling should seek to identify levels of nitrate concentrations and bacteria counts at a minimum.

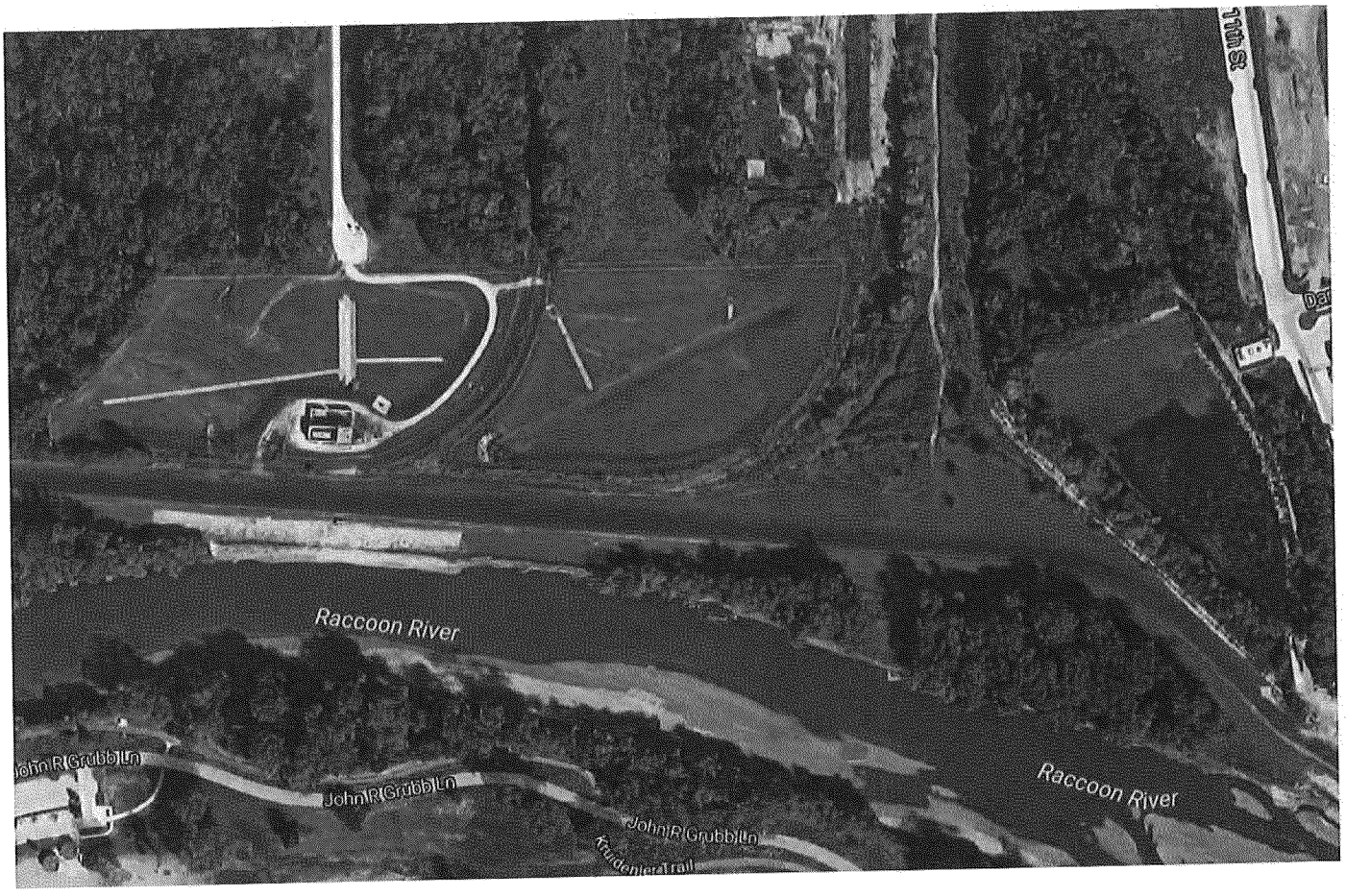
- **Describe the education/information program that will be developed as part of the project and anticipated budget.**

Educational signage will be provided on-site to describe the design and purpose of key features. An outreach program with the Des Moines Public Schools is being explored to allow for site visits and field trips to the wetlands. It is expected that outreach and training events including presentations and site visits potentially involving groups such as the Polk County SWCD, Iowa Stormwater Education Partnership, Des Moines Parks and Recreation, and local chapters of professional organizations such as American Society of Civil Engineers (ASCE), American Planning Association (APA), American Society of Landscape Architects (ASLA) and American Institute of Architects (AIA).

Beyond formal educational programs, this project will provide public awareness in an urban setting like no other project. It ties Iowa's largest downtown to the river in a way that will reach the most people possible. Furthermore, this will touch much more than the Des Moines Metro, but will act as a model for regional, state, and national improvements to water quality in an urban setting. This project would take an underutilized urban forest and revamp it into an educational landmark, amenity, and catalyst for water quality, sustainability, economic development, and urban renewal.

The ability of the City of Des Moines, Hubbell Realty Company, and the many partners to collaborate on this type of effort will bring together public and private entities in a unique collaboration to take real action toward environmental enhancement and improving water quality. The special significance of this project is that it will serve as a critical component in the holistic reclamation of the surrounding acres from their current Brownfield conditions, heavy industrial history and negative environmental impact. Adjacent acres to the project site include property that has been under US EPA management for two decades as a Superfund site following impact to the Raccoon River from past industrial practices. The comprehensive history of the full area, with its challenges and significant impacts to land and water, provide strong motivation to the partners to be able to tell a new and different story, one of betterment, improvement, public education opportunities and ongoing, living reclamation.

Current



Opportunity